



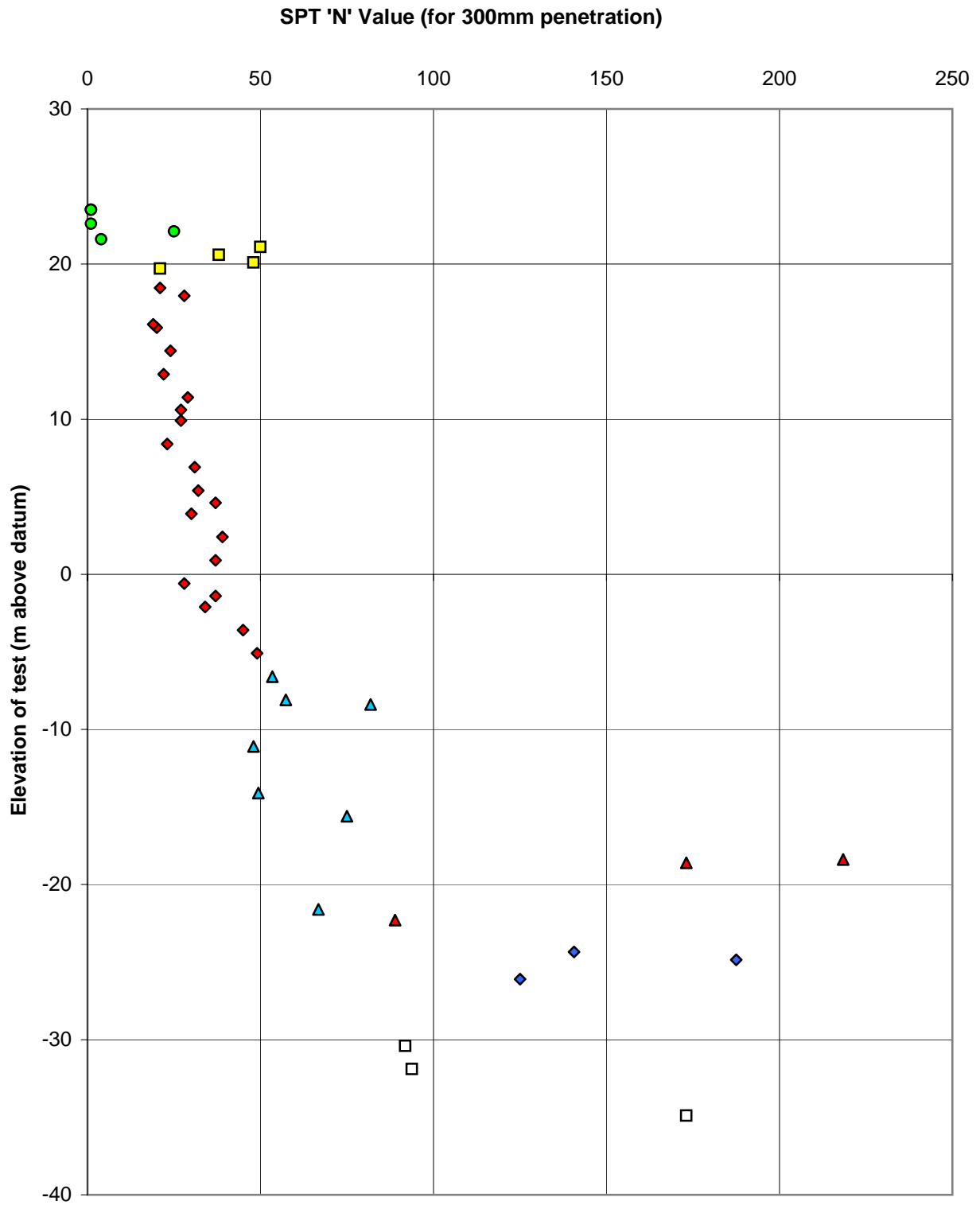
Specialist Engineering, Materials and Environmental Consultants

SPT 'N' VALUES vs Elevation

Site:
Denmark Place, London

Client:
Consolidated Developments Limited

Job Number:	36237
Figure:	3

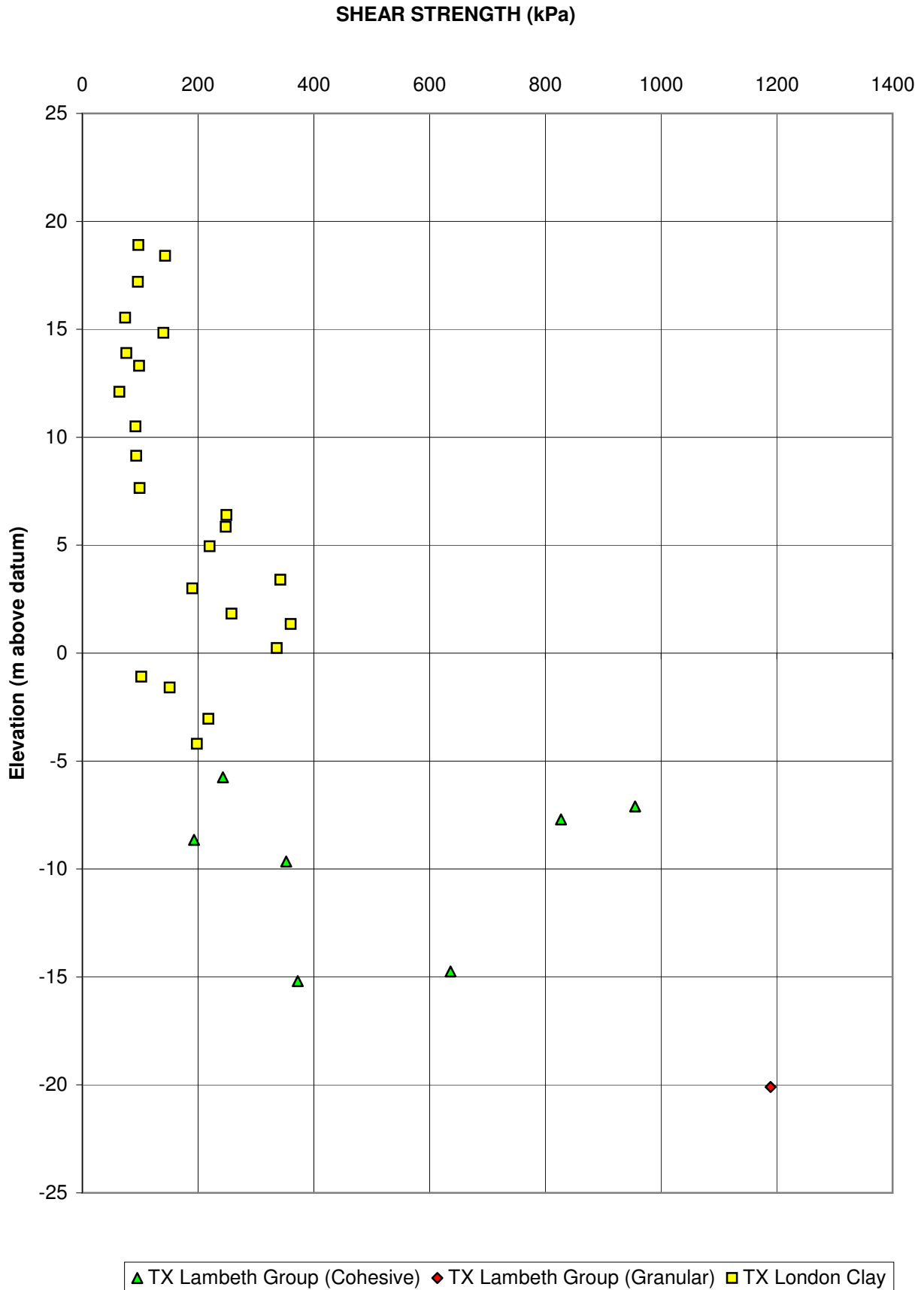


- ▲ Lambeth Group (Cohesive) ▲ Lambeth Group (Granular) ◆ London Clay
- Made Ground ■ River Terrace Deposits ◆ Thanet Sand Formation
- White Chalk

Site:
Denmark Place, London

Client:
Consolidated Developments Limited

Job Number:	36237
Figure:	4



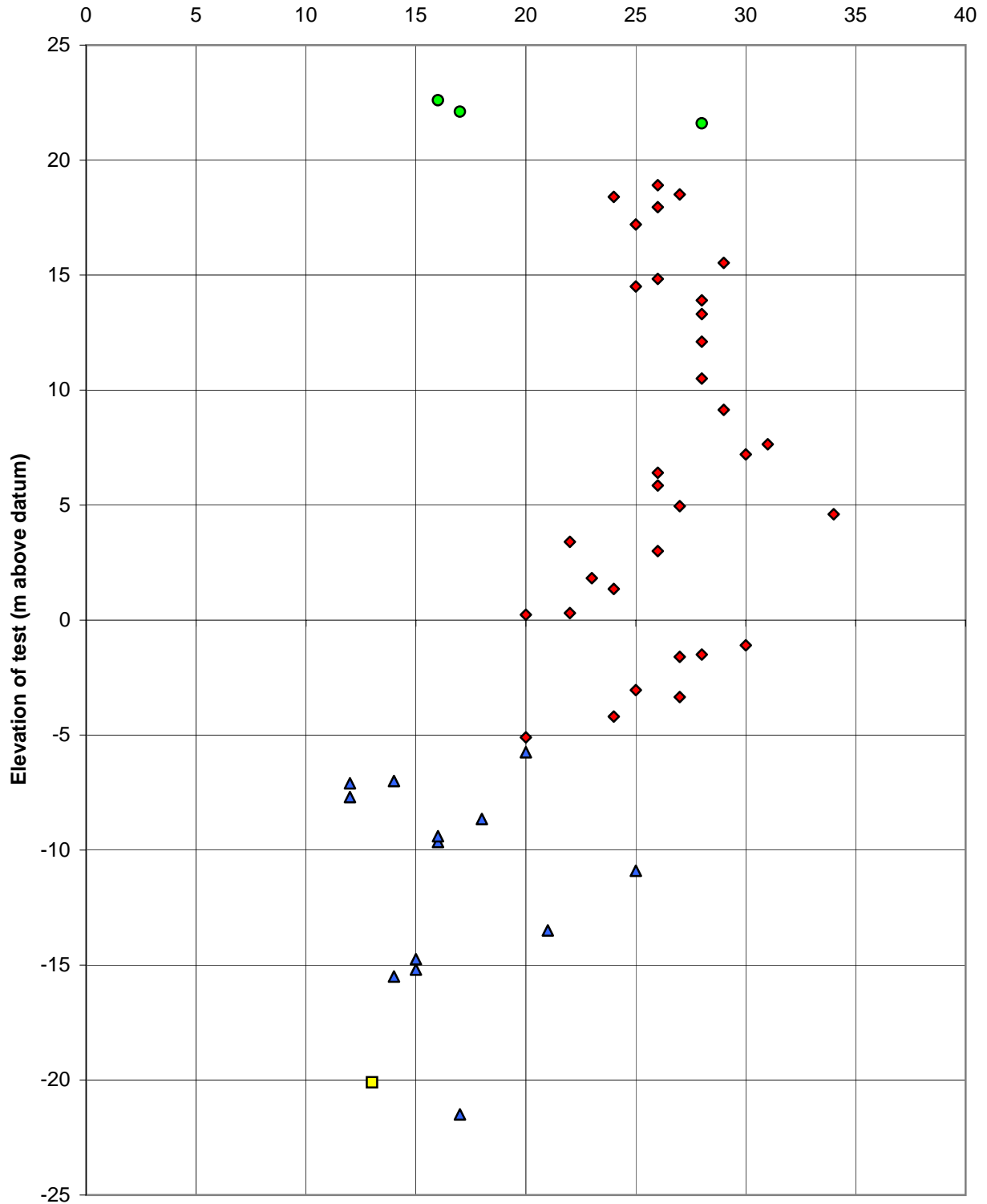
MOISTURE CONTENT vs ELEVATION

Site:
Denmark Place, London

Client:
Consolidated Developments Limited

Job Number: 36237
Figure: 5

Natural Moisture Content (%)



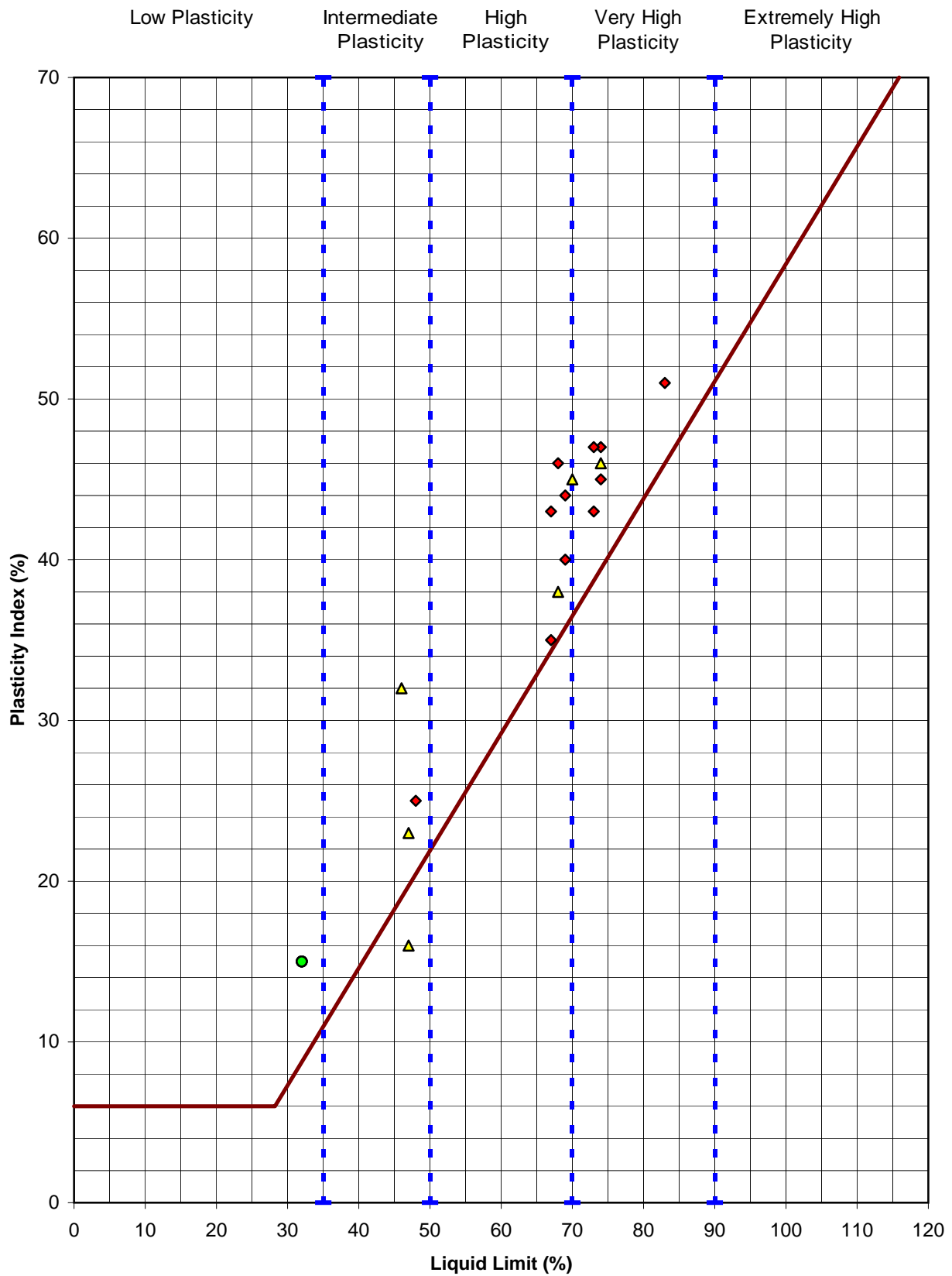
▲ Lambeth Group (Cohesive) ■ Lambeth Group (Granular) ◆ London Clay ● Made Ground

PLASTICITY CLASSIFICATION CHART

Site:
Denmark Place, London

Client:
Consolidated Developments Limited

Job Number:	36237
Figure:	6



A - Line	Classifications	Lambeth Group (Cohesive)
London Clay	Made Ground	

APPENDIX A
Fieldwork Records

APPENDIX A1

Borehole Records

(this appendix contains 14 pages including this one)

BOREHOLE RECORD (Rotary)

Borehole Number

Site:
Denmark Place

Easting:
529867.9

Northing:
181290.3

BH101

Client:
Consolidated Developments Limited

Ground Level:
25.10m AOD

Dates:
8 Apr 08
15 May 08

Job No.:
36237

BOREHOLE

CORE SAMPLES

STRATA RECORD

Sheet 1 of 7

Strike & Well	Samples & Testing	SPT 'N' Value	FI (per m)	TCR (%)	SCR (%)	RQD (%)	Depth (m)	Level (mAOD)	Key	Description
	B1 0.25						0.25	24.85		MADE GROUND: Grey unreinforced concrete.
	J1 TB1 0.50						0.70	24.40		MADE GROUND: Brick wall and brick wall rubble with occasional blue and white china fragments, ceramic tiles and clay smoking pipe fragments. Bricks are predominantly red with occasional yellow sandstone bricks towards the base.
	D1 0.90 B2 1.00 J3 TB3						1			MADE GROUND: Brown slightly sandy very clayey angular to subangular fine to coarse gravel of red brick fragments with occasional concrete, whole bricks and coal fragments. Sand is medium to coarse. ...at 0.75m depth, animal bone. ...at 1.20m depth, bone fragments. ...below 1.60m depth, very loose dark brown.
	J4 1.50 TB4 1.60 D2 B3	S					2			...below 2.50m depth, grey brown with occasional angular fine yellow sandstone brick fragments.
	D3 2.50 B4 J5 TB5	S					3			...below 3.00m depth, occasional subangular fine to medium flint gravel. Locally graded to sandy slightly gravelly clay.
	D4 3.00									
	B5 3.50 D5 J6 TB6	S					3.50	21.60		MADE GROUND: Very soft to soft slightly sandy slightly gravelly clay. Sand is fine to coarse. Gravel is angular to subangular fine to medium flint and red/yellow brick fragments.
	D6 4.00						4			
	B6 4.50 J7 TB7	C					4.40	20.70		Dense brown slightly silty sandy angular to subrounded fine to coarse flint GRAVEL. Sand is medium to coarse. (RIVER TERRACE DEPOSITS)
	D7 5.00						5			...below 5.40m depth, medium dense.
	B7 5.40 J8 TB8	C					5.40			
	D8 6.00						6	19.10		Firm locally thinly laminated orange brown CLAY with occasional dark brown/black laminae <1mm. (LONDON CLAY)
	J9 TB9									
	D9 6.50						6.50	18.60		Firm and stiff indistinctly fissured locally thinly laminated grey CLAY with occasional shiny speckles <1mm of selenite and occasional partings up to 1mm of light grey silt. (LONDON CLAY)
	U1 6.70						7			
	D10 7.10 D11 7.15	S					7.10			
										NR
	U2 7.90						7.70	17.40		Stiff locally thinly laminated closely to very closely fissured grey CLAY with occasional shiny speckles <1mm of selenite and occasional light grey silt partings <1mm. (LONDON CLAY)
	D12 8.30						8			100
	U3 9.57	S					9			
	D13 9.90									100

Continued next sheet

Remarks and Water Observations

Hand dug inspection pit to 1.50m - no services encountered. Cable percussion BH diameter 200mm to 7.60m depth and casing diameter 200mm to 7.00m depth. 30 gallons water added 4.40 - 6.00m. Water encountered at 5.60m depth - no rise. Casing left in the hole for rotary follow on. Geobore S rotary cored with water from 7.10m to 63.50m depth.

Scale: 1:50

Logged by: JB

Figure: A1

Site:
Denmark Place

Easting:
529867.9

Northing:
181290.3

Client:
Consolidated Developments Limited

Ground Level:
25.10m AOD

Dates:
8 Apr 08
15 May 08

Job No.:
36237

BOREHOLE	CORE SAMPLES	STRATA RECORD	Sheet 2 of 7
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Strike & Well	Samples & Testing	SPT 'N' Value	FI (per m)	TCR (%)	SCR (%)	RQD (%)	Depth (m)	Level (mAOD)	Key	Description
	U4 10.27									<p>Stiff locally thinly laminated closely to very closely fissured grey CLAY with occasional shiny speckles <1mm of selenite and occasional light grey silt partings <1mm. (LONDON CLAY)</p> <p>...below 11.50m depth, closely to extremely closely fissured</p> <p>...at 12.40m depth, 50mm fragment of moderately weak grey mudstone</p> <p>...between 15.62m and 15.70m depth, occasional fragments of very weak light grey mudstone</p> <p>...between 16.3m and 16.38m depth, moderately strong light grey mudstone ...between 16.42m and 16.5m depth, moderately weak to moderately strong light grey mudstone</p> <p>...below 18.70m depth, very stiff</p> <p style="text-align: right;">Continued next sheet</p>
	D14 10.60	S					11			
	U5 11.20	N=24		100						
	D15 11.60						12			
	U6 11.80									
	D16 12.20	S					13			
	U7 13.00	N=22		91						
	D17 13.35						14			
	D18 14.30	S		87						
	U8 14.60						15			
	D19 15.00	N=29								
	D20 15.80	S		87			16			
	U9 15.96									
	D21 17.90	S					17			
	U10 17.46	N=23		71						
	D22 19.10						18			
	U12 19.25	S								
	U11 18.70	N=31		100			19			
	D23 19.65	S								

Remarks and Water Observations
 Hand dug inspection pit to 1.50m - no services encountered. Cable percussion BH diameter 200mm to 7.60m depth and casing diameter 200mm to 7.00m depth. 30 gallons water added 4.40 - 6.00m. Water encountered at 5.60m depth - no rise. Casing left in the hole for rotary follow on. Geobore S rotary cored with water from 7.10m to 63.50m depth.

Scale: 1:50
Logged by: JB
Figure: A1

Site:
Denmark Place

Easting:
529867.9

Northing:
181290.3








Client:
Consolidated Developments Limited

Ground Level:
25.10m AOD

Dates:
8 Apr 08
15 May 08

Job No.:
36237

BOREHOLE	CORE SAMPLES	STRATA RECORD	Sheet 3 of 7
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Strike & Well	Samples & Testing	SPT 'N' Value	FI (per m)	TCR (%)	SCR (%)	RQD (%)	Depth (m)	Level (mAOD)	Key	Description
	U13 20.15	N=32								Stiff locally thinly laminated closely to very closely fissured grey CLAY with occasional shiny speckles <1mm of selenite and occasional light grey silt partings <1mm. (LONDON CLAY)
	D24 20.50			100			21			
		S								...at 21.35m depth, 5mm pyrite rich nodule
	U14 21.70	N=30								...at 21.65m depth, 5mm thick very weak light grey mudstone ...below 21.70m depth, locally hard
	D25 22.05 U15 22.10			100			22			
		S								
	U16 23.28	N=39								
	D26 23.60 U17 23.75			93			23			
		S								
	D27 24.10	N=37								...below 24.0m depth, dark grey with occasional dark grey silt partings up to 3mm thick and occasional light brown grey infilled 'worm' holes up to 2mm thick by 20mm long
	D28 24.80 U18 24.87			93			24			
		S								
	U19 26.20	N=28								
	D29 26.60 U20 26.70			100			25			
		S								
	D30 27.10	N=34								
	U21 28.15 D31 28.45			100			26			
		S								
	U22 29.30	N=45								
	D32 29.70			100			27			
		S								

Continued next sheet

Remarks and Water Observations
Hand dug inspection pit to 1.50m - no services encountered. Cable percussion BH diameter 200mm to 7.60m depth and casing diameter 200mm to 7.00m depth. 30 gallons water added 4.40 - 6.00m. Water encountered at 5.60m depth - no rise. Casing left in the hole for rotary follow on. Geobore S rotary cored with water from 7.10m to 63.50m depth.

Scale:	1:50
Logged by:	JB
Figure:	A1

Site:
Denmark Place

Easting:
529867.9

Northing:
181290.3

Client:
Consolidated Developments Limited

Ground Level:
25.10m AOD

Dates:
8 Apr 08
15 May 08

Job No.:
36237

BOREHOLE		CORE SAMPLES							STRATA RECORD		Sheet 4 of 7
Strike & Well	Samples & Testing	SPT 'N' Value	FI (per m)	TCR (%)	SCR (%)	RQD (%)	Depth (m)	Level (mAOD)	Key	Description	
	D33 30.20	S N=49					30.10 30.25 30.50	-5.00 -5.15 -5.40		Stiff locally thinly laminated closely to very closely fissured grey CLAY with occasional shiny speckles <1mm of selenite and occasional light grey silt partings <1mm. (LONDON CLAY)	
	U23 30.85 D34 30.90			83			31			Very stiff grey mottled dark green grey CLAY with occasional rounded fine to medium flint and occasional dark grey silt partings to 2mm. (LONDON CLAY BASAL BEDS)	
	D35 31.70	S 50/215mm					32			Very stiff green grey mottled orange brown CLAY with many white powdery shell fragments. (UPPER SHELLY BEDS, LAMBETH GROUP)	
	D36 32.10 U24 32.20			97			33			Hard and friable locally very stiff red brown mottled green grey CLAY with occasional partings of green grey clay and green grey slightly sandy silt. Sand is fine. (UPPER MOTTLED BEDS, READING FORMATION, LAMBETH GROUP)	
	U25 32.80						33			...between 32.7m and 35.0m depth, with many partings and thin to very thin beds of green grey very silty fine sand.	
	D37 33.20	S 50/190mm					34				
	U26 33.75			100			35				
	D38 34.50			80			36				
	U27 34.75			80			37				
	D39 36.00	S 39/200mm		120			37				
	D40 37.20			100			37.15	-12.0		Very stiff locally hard and friable locally thinly laminated mid to dark grey CLAY (UPPER MOTTLED BEDS, READING FORMATION, LAMBETH GROUP)	
				94			38				
	D41 38.60			100			38.85	-13.7		Hard (locally very stiff) closely to extremely closely fissured locally thinly laminated multicoloured (purple, grey, red brown, orange) CLAY with occasional thin beds to thick laminae of very silty fine sand. (UPPER MOTTLED BEDS, READING FORMATION, LAMBETH GROUP)	
				100			39			...between 39.0m and 39.3m depth, with some powdery white partings to 2mm - probably disintegrated shell fragments	
	D42 39.80 U28 39.85	S 50/275mm		NR						Continued next sheet	

Remarks and Water Observations

Hand dug inspection pit to 1.50m - no services encountered. Cable percussion BH diameter 200mm to 7.60m depth and casing diameter 200mm to 7.00m depth. 30 gallons water added 4.40 - 6.00m. Water encountered at 5.60m depth - no rise. Casing left in the hole for rotary follow on. Geobore S rotary cored with water from 7.10m to 63.50m depth.

Scale: 1:50

Logged by: JB

Figure: A1

Site:
Denmark Place

Easting:
529867.9

Northing:
181290.3

BH101

Client:
Consolidated Developments Limited

Ground Level:
25.10m AOD

Dates:
8 Apr 08
15 May 08

Job No.:
36237

BOREHOLE		CORE SAMPLES							STRATA RECORD		Sheet 5 of 7
Strike & Well	Samples & Testing	SPT 'N' Value	FI (per m)	TCR (%)	SCR (%)	RQD (%)	Depth (m)	Level (mAOD)	Key	Description	
	U29 40.30 D43 40.60	S 50/155mm		100			41	-16.2		Hard (locally very stiff) closely to extremely closely fissured locally thinly laminated multicoloured (purple, grey, red brown, orange) CLAY with occasional thin beds to thick laminae of very silty fine sand. (UPPER MOTTLED BEDS, READING FORMATION, LAMBETH GROUP)	
	D44 42.20 U31 42.25			100			42				
	U30 42.95			97			43			Very dense thinly interlaminated light grey and light brown slightly silty fine SAND. (LAMINATED BEDS, WOOLWICH FORMATION, LAMBETH GROUP)	
	D45 43.70	S = 50/30mm		67			44				
	D46 44.80 D47 45.10 U32 45.20						45	-20.0		Very dense locally thinly laminated dark grey brown clayey fine SAND. (LAMINATED BEDS, WOOLWICH FORMATION, LAMBETH GROUP)	
	U33 45.90			100			46	-20.4			
	D48 46.60	S 48/160mm					47	-21.9		Hard indistinctly fissured locally thinly to thickly laminated multicoloured (mottled green grey, grey green, purple, red brown and orange brown) sandy CLAY with occasional fine sand pockets and partings to 5mm. Sand is fine. (LOWER MOTTLED BEDS, READING FORMATION, LAMBETH GROUP) ...below 46.3m depth, with occasional dark green glauconitic sand within clay and within sand pockets and partings ...at 46.5m depth, 20mm rounded flint pebble	
	D49 47.70 U34 47.75			100			48				
	D50 49.25			57			48.80	-23.7		Very dense dark green grey silty fine SAND. (THANET SAND) ...between 47.85m and 47.95m depth, with subrounded to rounded fine to coarse flint gravel washed out of matrix ...between 48.1m and 48.35m depth, with subrounded to rounded fine to coarse flint gravel washed out of matrix	
				31			49				
		S		NR						Continued next sheet	

Remarks and Water Observations

Hand dug inspection pit to 1.50m - no services encountered. Cable percussion BH diameter 200mm to 7.60m depth and casing diameter 200mm to 7.00m depth. 30 gallons water added 4.40 - 6.00m. Water encountered at 5.60m depth - no rise. Casing left in the hole for rotary follow on. Geobore S rotary cored with water from 7.10m to 63.50m depth.

Scale: 1:50

Logged by: JB

Figure: A1

Site:
Denmark Place

Easting:
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BH101

Client:
Consolidated Developments Limited

Ground Level:
25.10m AOD

Dates:
8 Apr 08
15 May 08

Job No.:
36237

BOREHOLE

CORE SAMPLES

STRATA RECORD

Sheet 6 of 7

Strike & Well	Samples & Testing	SPT 'N' Value	FI (per m)	TCR (%)	SCR (%)	RQD (%)	Depth (m)	Level (mAOD)	Key	Description
		50/45mm		NR						Remaining Detail : 49.70m - 49.70m : ...between 49.7m and 50.65m depth, no recovery
	B8 51.30	S ± 50/50mm		43			51			...between 50.65m and 51.05m depth, subrounded to rounded medium to coarse flint and hard green grey speckled black clay - pushed down from above when rods removed and redrilled
	U35 51.50			100						...between 51.05m and 51.20m depth, very disturbed recovery
	U36 52.05			83						
	B9 52.50			100			52			
				71			52.80	-27.7		
				NR			53			No recovery - large flint cobbles (BULLHEAD BEDS)
							53.50	-28.4		...between 53.10m and 55.50m depth, poor recovery due to flints pushed down at end of coring bit.
				14			54			Weak to moderately strong, medium density, white CHALK. Fractures are near horizontal, closely to extremely closely spaced (10,40,180) infilled (1,2,3) with white comminuted chalk. GRADE B/1,2,3
				20			55			
	C1 55.73	S I 50/95mm		11	73	27	56			...between 55.90m and 56.10m depth, no recovery
				20						
				100	35	35				
				23			57			...between 57.0m and 57.35m depth, non intact due to SPT
	C2 57.42	S I 50/115mm					57.30	-32.2		Moderately weak to strong, medium density white with frequent pale grey staining CHALK. Fractures medium to closely spaced (100,275,500) tight, clean (1,2,3) to infilled with grey clay/smear or slightly stained orange brown. (GRADE A,B/2,3)
				5	93	52	58			...between 58.10m and 58.50m, poor recovery with subangular to subrounded flint cobbles up to 100mm.
	C3 58.95						59			
	C4 59.45			6	93	80				

Continued next sheet

Remarks and Water Observations

Hand dug inspection pit to 1.50m - no services encountered. Cable percussion BH diameter 200mm to 7.60m depth and casing diameter 200mm to 7.00m depth. 30 gallons water added 4.40 - 6.00m. Water encountered at 5.60m depth - no rise. Casing left in the hole for rotary follow on. Geobore S rotary cored with water from 7.10m to 63.50m depth.

Scale: 1:50

Logged by: JB

Figure: A1

Site:
Denmark Place

Easting:
529867.9

Northing:
181290.3

Client:
Consolidated Developments Limited

Ground Level:
25.10mAOD

Dates:
8 Apr 08
15 May 08

Job No.:
36237

BOREHOLE	CORE SAMPLES	STRATA RECORD	Sheet 7 of 7
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Strike & Well	Samples & Testing	SPT 'N' Value <small>S₁ I 50/50mm</small>	FI (per m)	TCR (%)	SCR (%)	RQD (%)	Depth (m)	Level (mAOD)	Key	Description		
	C5	60.30								Remaining Detail : 59.70m - 59.70m : ...between 59.70m and 59.90m depth, with 180mm long rinded flint cobble		
			7							...between 60.60m and 60.88m depth, rinded flint cobbles		
				93	57	50		61			...at 61.20m depth, 50mm flint cobble	
			8								...below 61.30m depth, moderately strong to strong, very high density	
	C6	61.50									...below 61.57m depth, fractures are widely to closely spaced (GRADE A,B/1,2,3)	
				3				62				
	C7	62.32			93	85	83					...between 62.60m and 62.72m depth, rinded angular fine to coarse flint gravel and cobbles in comminuted chalk matrix
			4									
				88	88	70						
							63.50	-38.4		End of Borehole at 63.50 m		
							64					
							65					
							66					
							67					
							68					
							69					

<p>Remarks and Water Observations</p> <p>Hand dug inspection pit to 1.50m - no services encountered. Cable percussion BH diameter 200mm to 7.60m depth and casing diameter 200mm to 7.00m depth. 30 gallons water added 4.40 - 6.00m. Water encountered at 5.60m depth - no rise. Casing left in the hole for rotary follow on. Geobore S rotary cored with water from 7.10m to 63.50m depth.</p>	Scale: 1:50
	Logged by: JB
	Figure: A1

Site:
Denmark Place

Easting:
529866.3

Northing:
181289.8

BH102

Client:
Consolidated Developments Limited

Ground Level:
25.11m AOD

Dates:
9 Apr 08
25 Apr 08

Job No.:
36237

BOREHOLE		CORE SAMPLES							STRATA RECORD		Sheet 1 of 6
Strike & Well	Samples & Testing	SPT 'N' Value	FI (per m)	TCR (%)	SCR (%)	RQD (%)	Depth (m)	Level (mAOD)	Key	Description	
							0.05	25.06		MADE GROUND: Tarmac.	
	J1 0.30 TB1 B1 0.50						0.25	24.86		MADE GROUND: Grey unreinforced concrete.	
	J2 0.70 TB2 D1						0.50	24.61		MADE GROUND: Brown silty very sandy angular to subangular fine to coarse gavel of brick fragments with occasional whole bricks, concrete fragments, flint and coal. Sand is fine to coarse.	
	B2 1.40 J3 TB3 1.60 D2 B3	S N=1					1			MADE GROUND: Soft to firm dark brown slightly sandy slightly gravelly clay. Sand is fine to coarse. Gravel is angular to subangular fine to coarse brick and concrete with occasional coal fragments, clay cigarette pipes and animal bones. ...below 1.40m depth, mottled orange brown.	
	U1 2.50 J4 TB4										
	D3 2.95 B4 3.00 D4	S N=25					3	21.91		MADE GROUND: Firm orange brown slightly sandy gravelly clay. Sand is fine to coarse. Gravel is angular to subangular fine to coarse flint with occasional red brick fragments.	
	J5 3.50 TB5 3.60 D5						3.20	21.61			
	B5 4.00 D6	S N=50					4			Very dense brown slightly silty sandy angular to subrounded fine to coarse flint GRAVEL. Sand is medium to coarse. (RIVER TERRACE DEPOSITS)	
	J6 4.50 TB6										
	B6 5.00 J7 TB7 5.50	C N=48					5			...below 5.00m depth, dense.	
	D7 6.00 U2 6.20 J8 TB8						6	19.11		Firm locally thinly laminated orange brown CLAY with occasional dark brown/black laminae <1mm. (LONDON CLAY)	
	D8 6.60 D9 6.65	S N=21					6.50	18.61		Firm (locally stiff) indistinctly fissured locally thinly laminated grey CLAY with occasional shiny speckles <1mm of selenite and occasional partings up to 1mm of light grey silt. (LONDON CLAY)	
							7.50	17.61		(LONDON CLAY)	
		S N=19					8				
							9			...between 9.00m and 9.45m depth, stiff grey CLAY with occasional shiny speckles <1mm of selenite.	

Continued next sheet

Remarks and Water Observations

Hand dug inspection pit to 1.60m - no services encountered. Cable percussion BH diameter 200mm to 7.50m depth and casing diameter 200mm to 7.00m depth. 30 gallons water added 3.50 - 6.00m. Water 10/04/08 pm, 4.40m, 11/04/08 am 4.00m, casing at 5.00m. Casing left in the hole for rotary follow on. Open holed using water to 54.00m depth for 9 in-situ pressure metre tests. Strata boundaries inferred from Driller's Descriptions and from DI 101 strata.

Scale: 1:50

Logged by: JB

Figure: A1

Site:
Denmark Place

Easting:
529866.3

Northing:
181289.8

Client:
Consolidated Developments Limited

Ground Level:
25.11mAOD

Dates:
9 Apr 08
25 Apr 08

Job No.:
36237

BOREHOLE

CORE SAMPLES

STRATA RECORD

Sheet 2 of 6

Strike & Well	Samples & Testing	SPT 'N' Value	FI (per m)	TCR (%)	SCR (%)	RQD (%)	Depth (m)	Level (mAOD)	Key	Description
							11			(LONDON CLAY)
							12			
							13			
							14			...between 14.50m and 14.95m depth, stiff grey CLAY with occasional shiny speckles <1mm of selenite.
							15			
							16			
							17			...between 16.80m and 17.10m depth, suspected 'CLAYSTONE' (Driller's Description)
							18			
							19			

S
N=27

Continued next sheet

Remarks and Water Observations

Hand dug inspection pit to 1.60m - no services encountered. Cable percussion BH diameter 200mm to 7.50m depth and casing diameter 200mm to 7.00m depth. 30 gallons water added 3.50 - 6.00m. Water 10/04/08 pm, 4.40m, 11/04/08 am 4.00m, casing at 5.00m. Casing left in the hole for rotary follow on. Open holed using water to 54.00m depth for 9 in-situ pressure metre tests. Strata boundaries inferred from Driller's Descriptions and from BH101 strata.

Scale: 1:50
Logged by: JB
Figure: A1

Site:
Denmark Place

Easting:
529866.3

Northing:
181289.8

Client:
Consolidated Developments Limited

Ground Level:
25.11mAOD

Dates:
9 Apr 08
25 Apr 08

Job No.:
36237

BOREHOLE

CORE SAMPLES

STRATA RECORD

Sheet 3 of 6

Strike & Well	Samples & Testing	SPT 'N' Value	FI (per m)	TCR (%)	SCR (%)	RQD (%)	Depth (m)	Level (mAOD)	Key	Description
		S N=37					21			(LONDON CLAY) ...between 20.50m and 20.95m depth, very stiff grey CLAY with occasional shiny speckles <1mm of selenite.
		S N=37					22			
							23			
							24			
							25			
							26			
							27			...between 26.50m and 36.95m depth, very stiff grey CLAY with occasional shiny speckles <1mm of selenite)
							28			
							29			

Continued next sheet

Remarks and Water Observations

Hand dug inspection pit to 1.60m - no services encountered. Cable percussion BH diameter 200mm to 7.50m depth and casing diameter 200mm to 7.00m depth. 30 gallons water added 3.50 - 6.00m. Water 10/04/08 pm, 4.40m, 11/04/08 am 4.00m, casing at 5.00m. Casing left in the hole for rotary follow on. Open holed using water to 54.00m depth for 9 in-situ pressure metre tests. Strata boundaries inferred from Driller's Descriptions and from BH101 strata.

Scale: 1:50

Logged by: JB

Figure: A1

Site:
Denmark Place

Easting:
529866.3

Northing:
181289.8

Client:
Consolidated Developments Limited

Ground Level:
25.11mAOD

Dates:
9 Apr 08
25 Apr 08

Job No.:
36237

BOREHOLE

CORE SAMPLES

STRATA RECORD

Sheet 4 of 6

Strike & Well	Samples & Testing	SPT 'N' Value	FI (per m)	TCR (%)	SCR (%)	RQD (%)	Depth (m)	Level (mAOD)	Key	Description
							30.25	-5.14		(LONDON CLAY)
							30.50	-5.39		(UPPER SHELLY BEDS, LAMBETH GROUP)
							31			(UPPER MOTTLED BEDS, READING FORMATION, LAMBETH GROUP)
							32			
							33			...33.50m and 33.73m depth, very stiff to hard red brown mottled light blue grey CLAY)
							34			
							35			
							36			
							37			
							38			
							39			

S I
50/145mm

Continued next sheet

Remarks and Water Observations

Hand dug inspection pit to 1.60m - no services encountered. Cable percussion BH diameter 200mm to 7.50m depth and casing diameter 200mm to 7.00m depth. 30 gallons water added 3.50 - 6.00m. Water 10/04/08 pm, 4.40m, 11/04/08 am 4.00m, casing at 5.00m. Casing left in the hole for rotary follow on. Open holed using water to 54.00m depth for 9 in-situ pressure metre tests. Strata boundaries inferred from Driller's Descriptions and from BH101 strata.

Scale: 1:50

Logged by: JB

Figure: A1

BOREHOLE RECORD (Rotary - Open Hole)

Borehole
Number

BH102

Site:
Denmark Place

Easting:
529866.3

Northing:
181289.8

Client:
Consolidated Developments Limited

Ground Level:
25.11mAOD

Dates:
9 Apr 08
25 Apr 08

Job No.:
36237

BOREHOLE		CORE SAMPLES							STRATA RECORD		Sheet 5 of 6
Strike & Well	Samples & Testing	SPT 'N' Value	FI (per m)	TCR (%)	SCR (%)	RQD (%)	Depth (m)	Level (mAOD)	Key	Description	
							41		(UPPER MOTTLED BEDS, READING FORMATION, LAMBETH GROUP)		
							41.30	-16.2		(LAMINATED BEDS, WOOLWICH FORMATION, LAMBETH GROUP)	
							42				
							43				
							44			...between 43.50m and 43.60m depth, very dense thinly laminated light grey and light brown silty fine SAND.	
							45				
							45.50	-20.4		(LOWER MOTTLED BEDS, READING FORMATION, LAMBETH GROUP)	
							46				
							47.05	-21.9		(UPNOR FORMATION, LAMBETH GROUP)	
							48			...between 47.40m and 47.65m depth, very dense green fine to coarse glauconitic SAND over very stiff brown grey thinly laminated CLAY with silt laminae.	
							48.80	-23.7		...between 48.65m and 48.82 m depth, gravel band - 50% flush lost (Driller's Description)	
							49			(THANET SAND)	
										...between 49.45m and 49.61m depth, very dense grey slightly silty fine SAND.	

Continued next sheet

Remarks and Water Observations

Hand dug inspection pit to 1.60m - no services encountered. Cable percussion BH diameter 200mm to 7.50m depth and casing diameter 200mm to 7.00m depth. 30 gallons water added 3.50 - 6.00m. Water 10/04/08 pm, 4.40m, 11/04/08 am 4.00m, casing at 5.00m. Casing left in the hole for rotary follow on. Open holed using water to 54.00m depth for 9 in-situ pressure metric tests. Strata boundaries inferred from Driller's Descriptions and from BH101 strata.

Scale: 1:50

Logged by: JB

Figure: A1

Site:
Denmark Place

Easting:
529866.3

Northing:
181289.8

Client:
Consolidated Developments Limited

Ground Level:
25.11mAOD

Dates:
9 Apr 08
25 Apr 08

Job No.:
36237

BOREHOLE

CORE SAMPLES

STRATA RECORD

Sheet 6 of 6

Strike & Well	Samples & Testing	SPT 'N' Value	FI (per m)	TCR (%)	SCR (%)	RQD (%)	Depth (m)	Level (mAOD)	Key	Description
							51			(THANET SAND)
							52			
							52.85	-27.7		(WHITE CHALK)
							53			
							53.30	-28.2		(WHITE CHALK)
							54.0064	-28.9		<i>End of Borehole at 54.00 m</i>
							55			
							56			
							57			
							58			
							59			

Remarks and Water Observations

Hand dug inspection pit to 1.60m - no services encountered. Cable percussion BH diameter 200mm to 7.50m depth and casing diameter 200mm to 7.00m depth. 30 gallons water added 3.50 - 6.00m. Water 10/04/08 pm, 4.40m, 11/04/08 am 4.00m, casing at 5.00m. Casing left in the hole for rotary follow on. Open holed using water to 54.00m depth for 9 in-situ pressure metre tests. Strata boundaries inferred from Driller's Descriptions and from BH101 strata.

Scale: 1:50

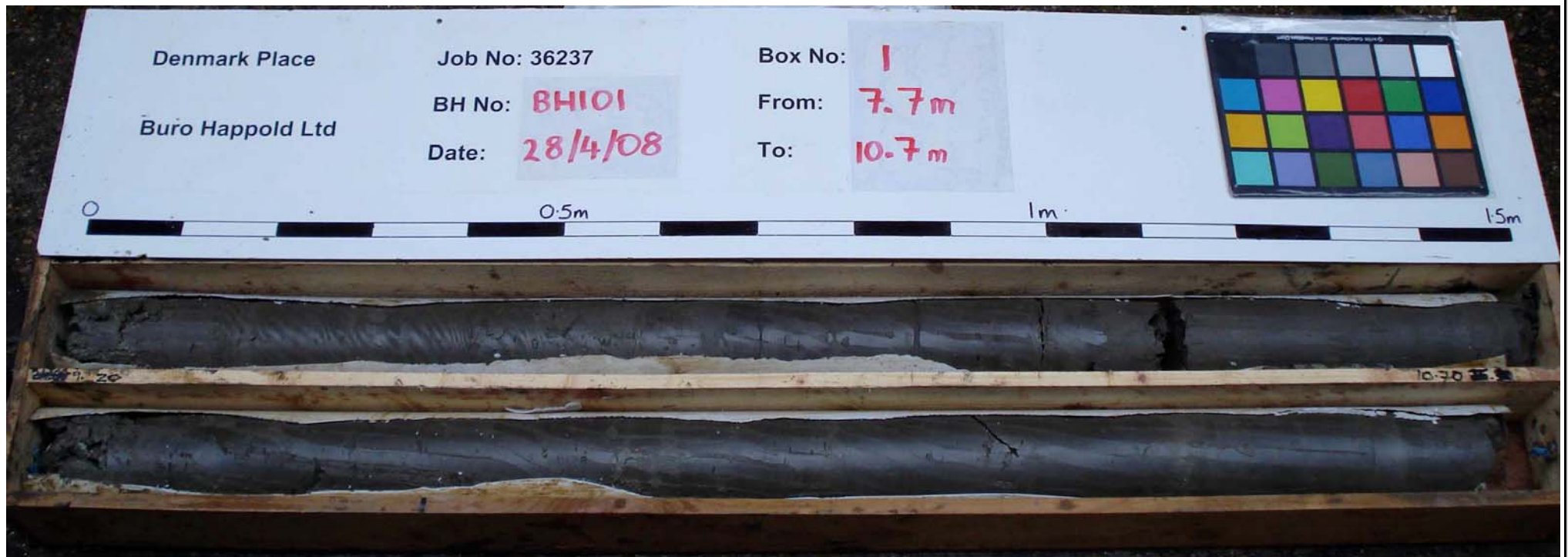
Logged by: JB

Figure: A1

APPENDIX A2

Core Photographs

(this appendix contains 20 pages including this one)



Site:	Denmark Place	Client:	Consolidated Developments Limited
Source:	STATS	Scale:	Scale indicated within photograph



CORE PHOTOGRAPH

Job No:	36237
Fig No:	Appendix A2

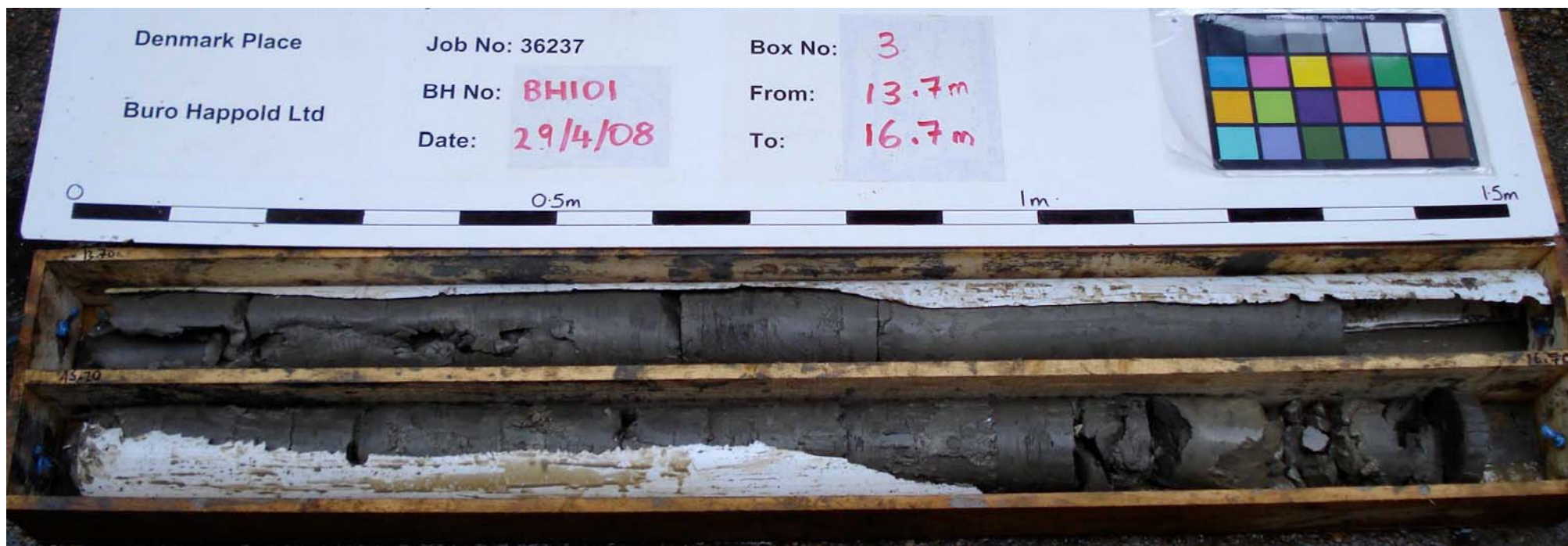


Site:	Denmark Place	Client:	Consolidated Developments Limited
Source:	STATS	Scale:	Scale indicated within photograph



CORE PHOTOGRAPH

Job No:	36237
Fig No:	Appendix A2

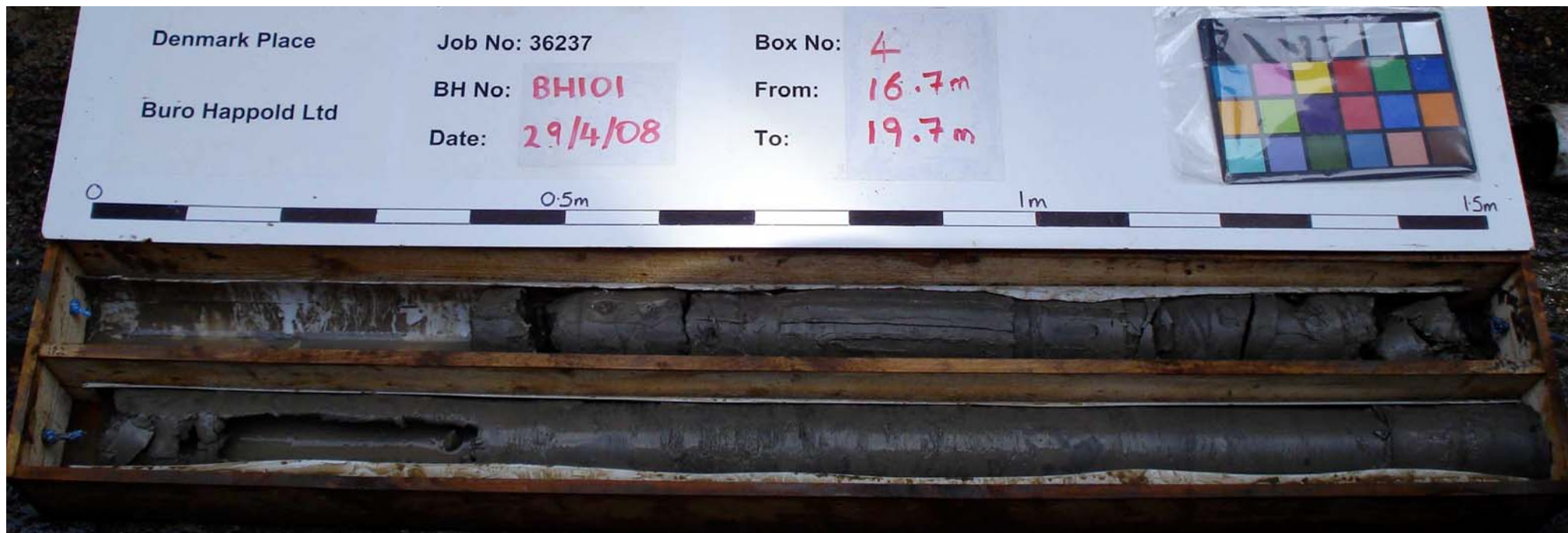


Site:	Denmark Place	Client:	Consolidated Developments Limited
Source:	STATS	Scale:	Scale indicated within photograph

STATS

CORE PHOTOGRAPH

Job No:	36237
Fig No:	Appendix A2



Site:	Denmark Place	Client:	Consolidated Developments Limited
Source:	STATS	Scale:	Scale indicated within photograph



CORE PHOTOGRAPH

Job No:	36237
Fig No:	Appendix A2



Site:	Denmark Place	Client:	Consolidated Developments Limited
Source:	STATS	Scale:	Scale indicated within photograph



CORE PHOTOGRAPH

Job No: 36237

Fig No: Appendix A2



Site:	Denmark Place	Client:	Consolidated Developments Limited
Source:	STATS	Scale:	Scale indicated within photograph



CORE PHOTOGRAPH

Job No:	36237
Fig No:	Appendix A2



Site:	Denmark Place	Client:	Consolidated Developments Limited
Source:	STATS	Scale:	Scale indicated within photograph



CORE PHOTOGRAPH

Job No:	36237
Fig No:	Appendix A2

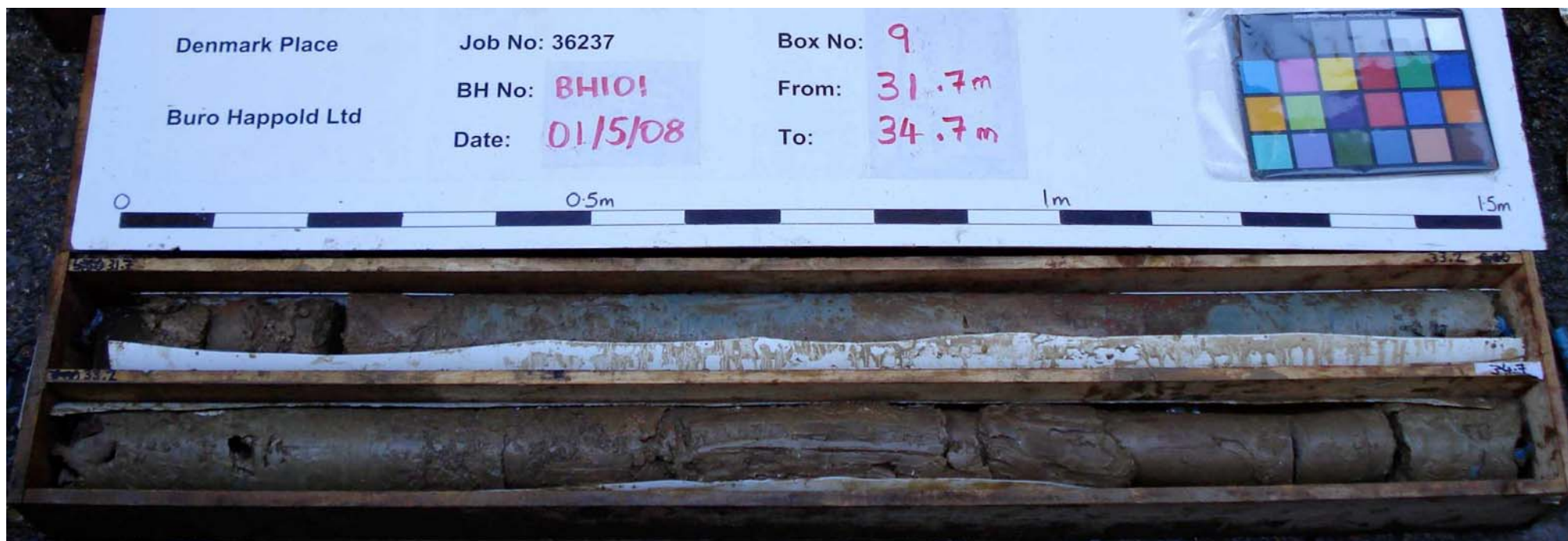


Site:	Denmark Place	Client:	Consolidated Developments Limited
Source:	STATS	Scale:	Scale indicated within photograph



CORE PHOTOGRAPH

Job No:	36237
Fig No:	Appendix A2



Site:	Denmark Place	Client:	Consolidated Developments Limited
Source:	STATS	Scale:	Scale indicated within photograph



CORE PHOTOGRAPH

Job No:	36237
Fig No:	Appendix A2



Site:	Denmark Place	Client:	Consolidated Developments Limited
Source:	STATS	Scale:	Scale indicated within photograph



CORE PHOTOGRAPH

Job No:	36237
Fig No:	Appendix A2



Site:	Denmark Place	Client:	Consolidated Developments Limited
Source:	STATS	Scale:	Scale indicated within photograph



CORE PHOTOGRAPH

Job No:	36237
Fig No:	Appendix A2



Site:	Denmark Place	Client:	Consolidated Developments Limited
Source:	STATS	Scale:	Scale indicated within photograph



CORE PHOTOGRAPH

Job No:	36237
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Site:	Denmark Place	Client:	Consolidated Developments Limited
Source:	STATS	Scale:	Scale indicated within photograph



CORE PHOTOGRAPH

Job No:	36237
Fig No:	Appendix A2



Site:	Denmark Place	Client:	Consolidated Developments Limited
Source:	STATS	Scale:	Scale indicated within photograph



CORE PHOTOGRAPH

Job No: 36237

Fig No: Appendix A2

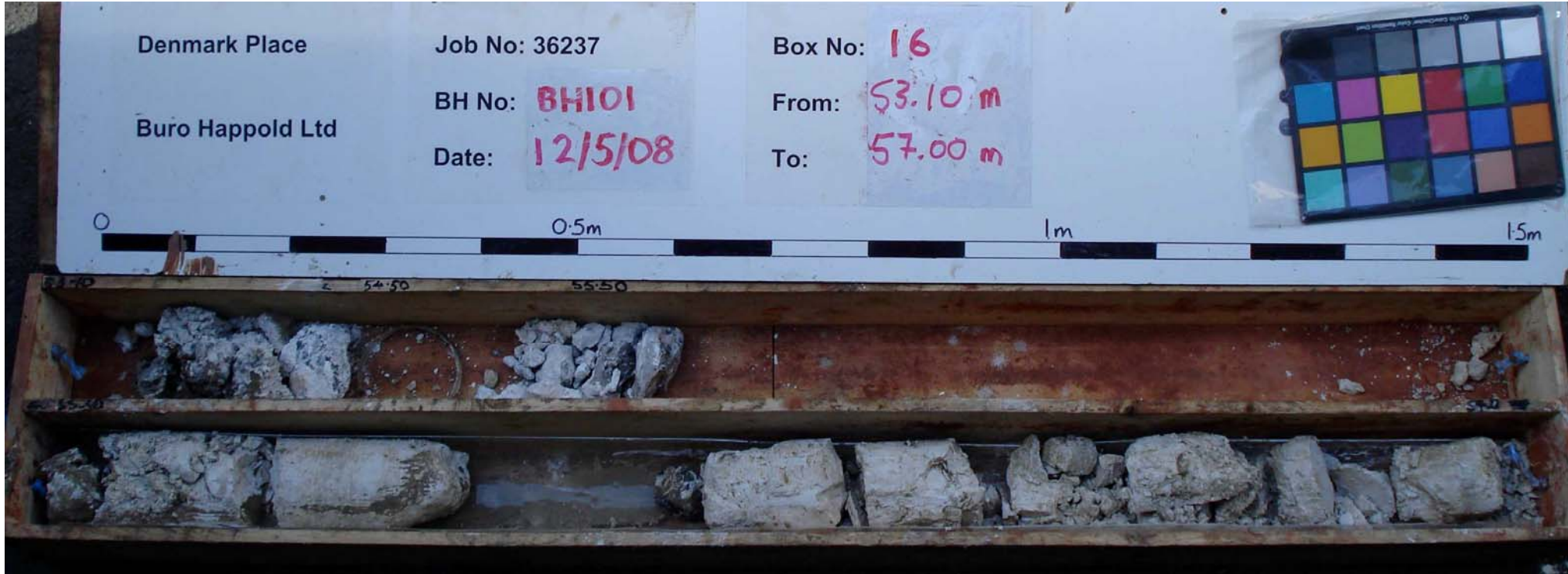


Site:	Denmark Place	Client:	Consolidated Developments Limited
Source:	STATS	Scale:	Scale indicated within photograph



CORE PHOTOGRAPH

Job No:	36237
Fig No:	Appendix A2



Site:	Denmark Place	Client:	Consolidated Developments Limited
Source:	STATS	Scale:	Scale indicated within photograph



CORE PHOTOGRAPH

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Source:	STATS	Scale:	Scale indicated within photograph



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Site:	Denmark Place	Client:	Consolidated Developments Limited
Source:	STATS	Scale:	Scale indicated within photograph



CORE PHOTOGRAPH

Job No:	36237
Fig No:	Appendix A2



Site:	Denmark Place	Client:	Consolidated Developments Limited
Source:	STATS	Scale:	Scale indicated within photograph



CORE PHOTOGRAPH

Job No:	36237
Fig No:	Appendix A2

APPENDIX A3

Cambridge Insitu Pressuremeter Testing Report and Data

(this appendix contains 1 CD and 1 page including this one)

DENMARK PLACE

GROUND INVESTIGATION

**Results of self bored pressuremeter tests
carried out by Cambridge Insitu Ltd**

Our reference: CIR1194
Main contractor reference: 36237
Report date: June 2008

Volume 2 of 2

Plots and data for tests in BH102

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HTTP: www.cambridge-insitu.com

Contents of Volume 2

Included tests

Test	Date	Depth (mBGL)	Probe	Remarks
B102 T1	15-Apr-08	8.5	WRSBP6	London Clay
B102 T2	15-Apr-08	14.0	WRSBP6	London Clay
B102 T3	16-Apr-08	20.0	WRSBP6	London Clay
B102 T4	16-Apr-08	26.0	WRSBP6	London Clay
B102 T5	17-Apr-08	33.0	WRSBP6	Lambeth Group - reddish/grey clay
B102 T6	18-Apr-08	43.0	WRSBP6	Lambeth Group - layered sand/green clay
B102 T7	21-Apr-08	47.9	WRSBP6	Sandy gravely blue/green silt - probably Upnor Beds
B102 T8	22-Apr-08	50.0	WRSBP6	Thanet Sand - some gravel in the hole
B102 T9	22-Apr-08	51.0	WRSBP6	Thanet Sand - drilled on from test 8

This volume is laid out as follows:

- a) A summary section showing various parameters plotted against depth. This starts with a plot showing the field curves of all tests on common axes of pressure and displacement.
- b) A detailed presentation of the shear modulus information gathered from unload/reload cycles. Some of these are summary plots.

This is then followed by the analysis data for the individual tests. For each test there are the following pages in approximately the following order:

1. A Results Summary Sheet
2. A plot of Total pressure/Cavity strain
3. Where appropriate, a plot on axes of Average Radial Displacement/ Total pressure showing the choice of cavity reference pressure suggested by initial cavity movement ('Lift-off' analysis).
4. A plot on axes of Average Radial Displacement/ Total pressure showing the Marsland & Randolph (1977, modified) construction.
5. Where appropriate, a plot on axes of pore pressure vs total pressure showing the development of excess pore pressure during the test and identifying, where possible, the cavity reference pressure from the onset of cavity expansion.
6. For undrained tests, a plot on axes of $\ln[\text{current cavity shear strain}]/\text{Total Pressure}$ showing loading data and the use of the perfectly plastic solution to obtain the undrained shear strength and limit pressure (after Gibson & Anderson, 1961)
7. A plot on axes of $\ln[\text{current cavity shear strain}]/\text{Total Pressure}$ (unloading) showing contraction data and the use of the perfectly plastic solution to obtain the undrained shear strength (after Jefferies, 1987).
8. For undrained tests, a plot of shear stress vs shear strain for the expansion phase of the test using the procedure suggested by Palmer (1972).
9. For undrained tests, a plot of shear stress vs shear strain for the contraction phase of the test using the procedure suggested by Palmer (1972).
10. For drained tests, a plot on axes of $\ln[\text{cavity strain}]/\ln[\text{Effective radial stress}]$ showing the peak angle of internal friction and dilation (Hughes et al,

1977).

11. Plots on axes of Radial displacement/Total Pressure showing enlarged views of unload/reload cycles and quoting shear modulus G
12. Plots on axes of $\ln[\text{current cavity shear strain}]/\ln[\text{Total Pressure}]$ showing loop reloading paths and quoting the gradient and intercept for each loop.
13. A plot on axes of secant shear modulus/Log[Shear strain] showing the decay of stiffness against strain curves derived from fitting a power law function to reloading data, all cycles. Individual data points obtained from applying Palmer (1972) directly to reloading data are also shown.
14. For undrained tests, a plot on axes of Average Cavity Strain/ Total pressure showing the results of curve fitting the field curve with the best set of parameters using a non-linear elastic/perfectly plastic solution (Whittle, '99).

If a drained test has been carried out:

15. Manassero, 1989 – A plot of effective radial stress vs cavity strain, showing the loading curve with the loops removed.
16. Manassero, 1989 – A plot of volumetric strain vs shear strain, loading and unloading data shown.
17. Manassero, 1989 – A plot of the current mobilised friction and dilation angle vs shear strain, loading and unloading data shown.
18. Manassero, 1989 – A plot of shear stress vs shear strain, loading and unloading data shown.
19. Manassero, 1989 – A plot of stress ratio vs shear strain, loading and unloading data shown.
20. Manassero, 1989 – A plot of shear stress vs normal stress, for both loading and unloading data. A line is plotted showing the peak angle of internal friction.

The following pages apply to all tests:

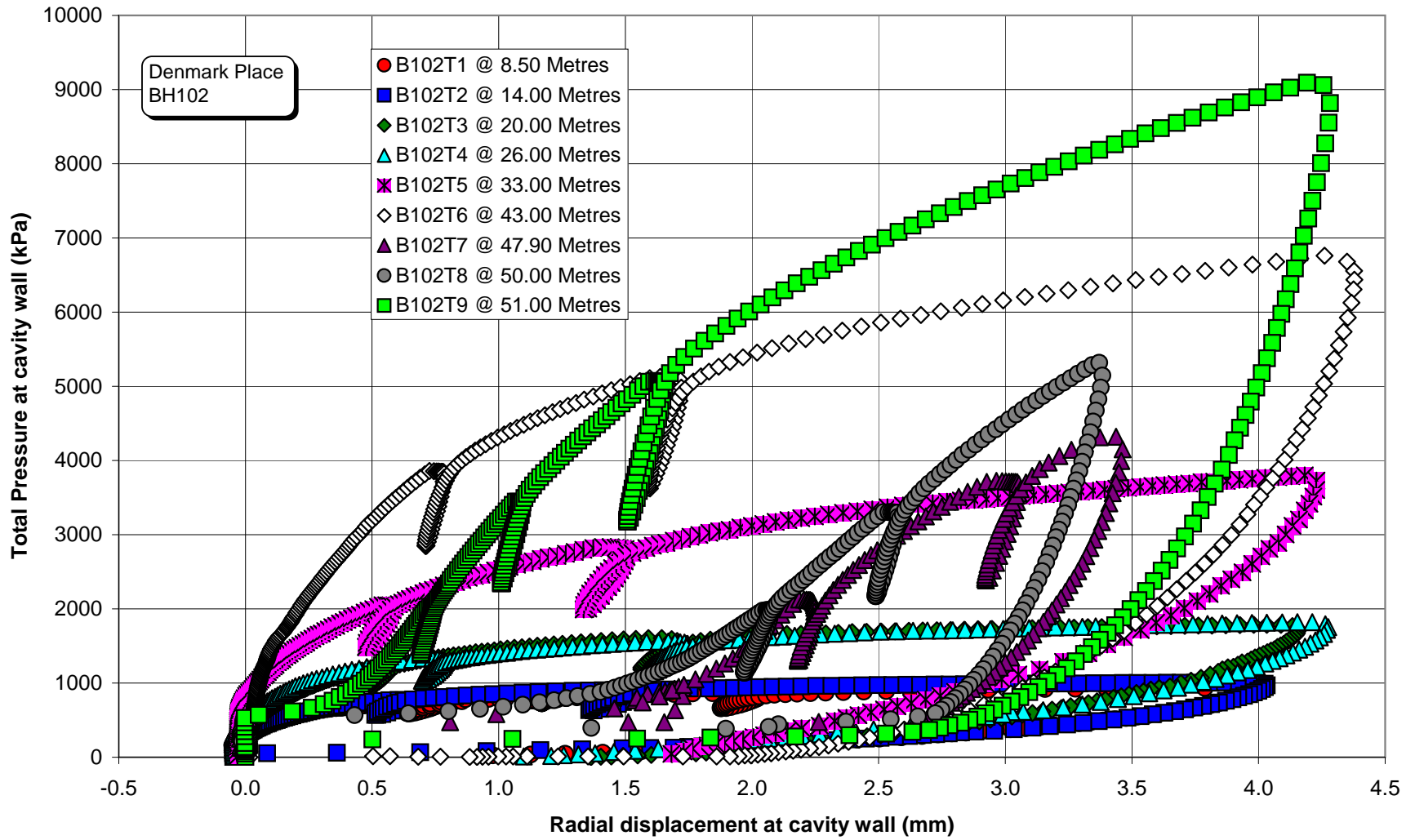
21. A handwritten test record sheet
22. From WINLOG - On axes of Radial Displacement/Total Pressure showing average displacement.
23. From WINLOG - On axes of Radial Displacement/Total Pressure showing all displacement sensors
24. From WINLOG - On axes of Radial Displacement/Total Pressure showing the three pairs of displacement sensors.
25. From WINLOG - On axes of Radial Displacement/Total Pressure showing two loading curves, the average of the odd numbered arms and the average of the even numbered arms.

Because the information presented here comes from a variety of sources it is not possible to number the pages in a coherent manner, although within a test some pages may be numbered.

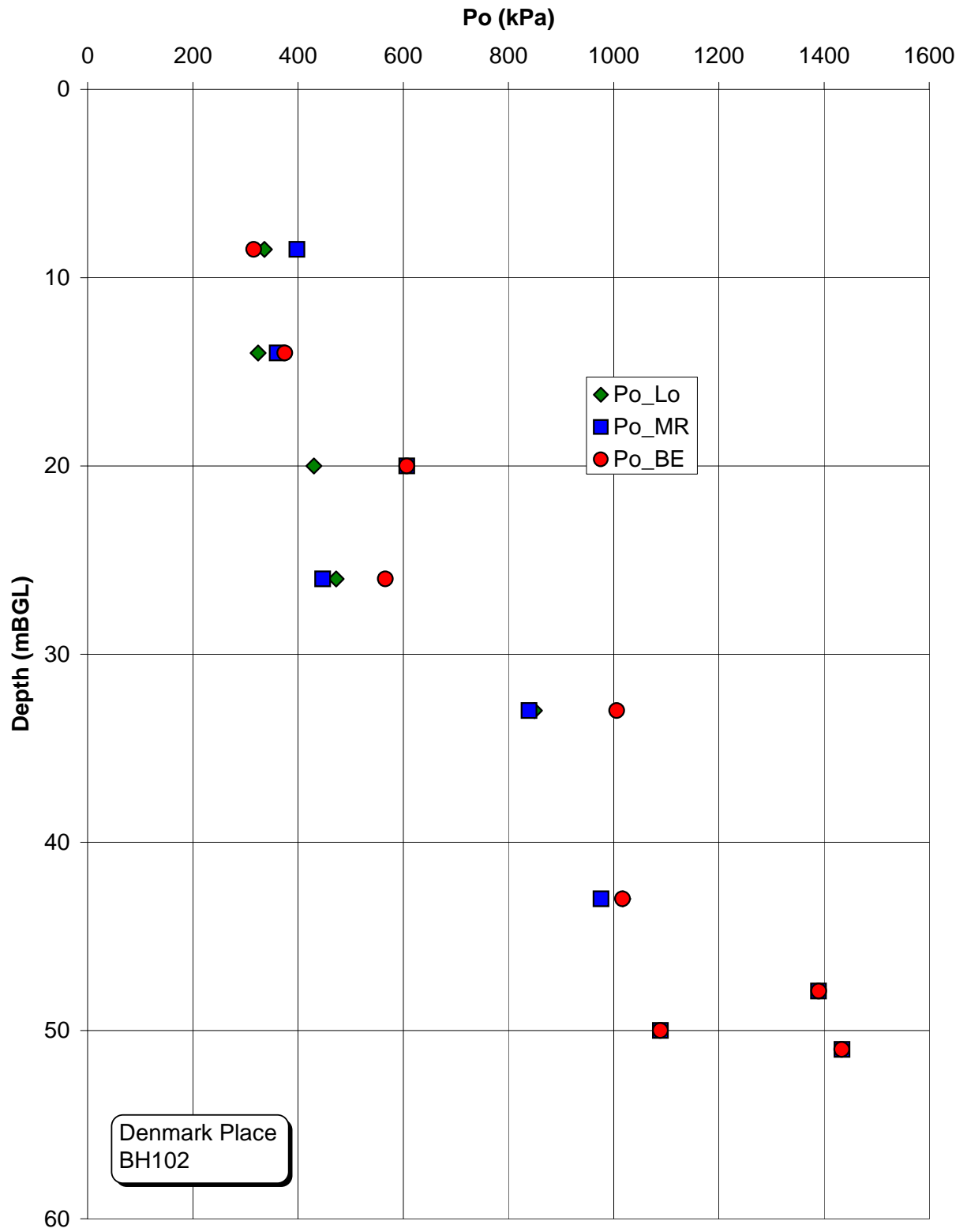
BOREHOLE BH102

RESULTS SUMMARY PLOTS

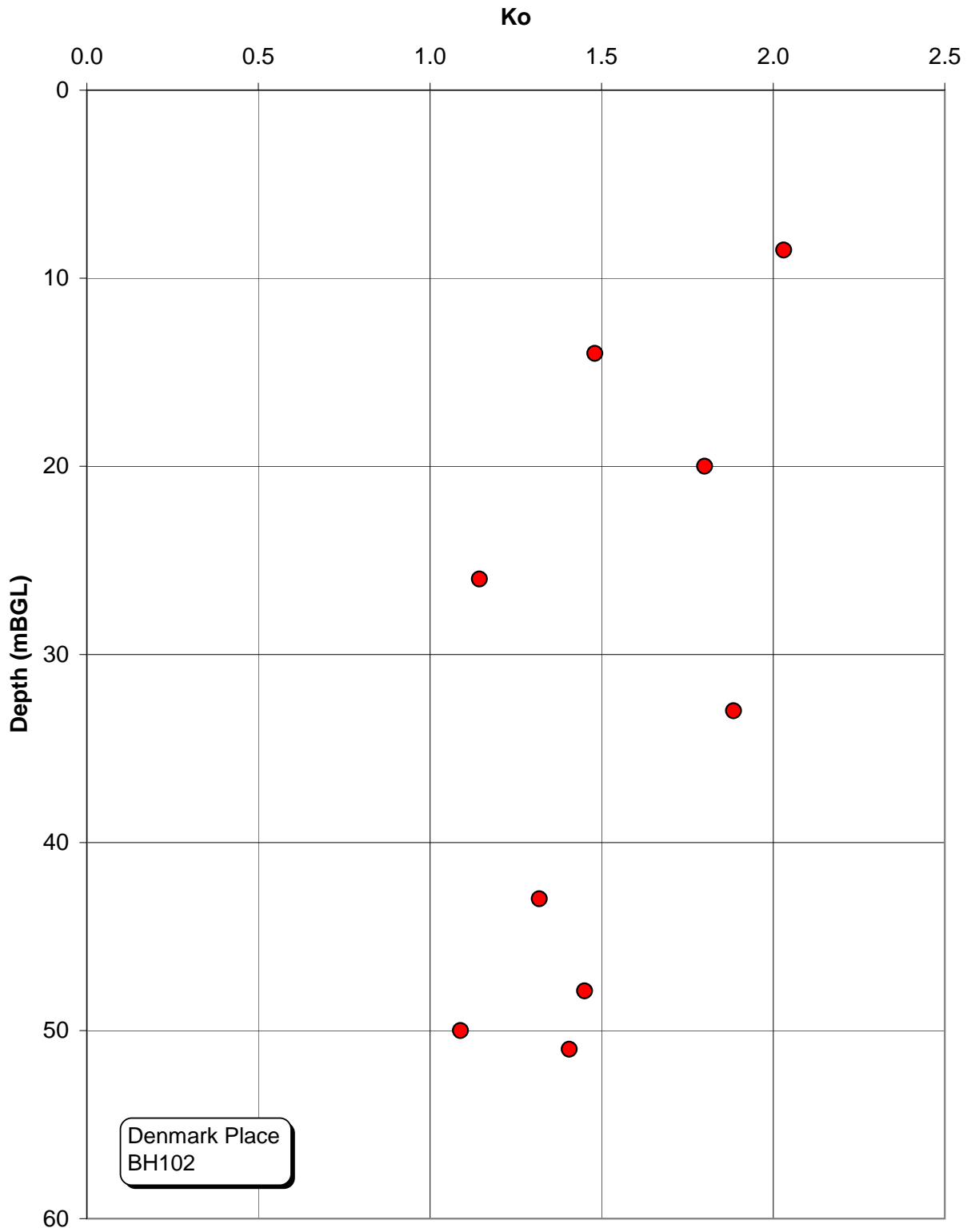
Total pressure vs Radial displacement



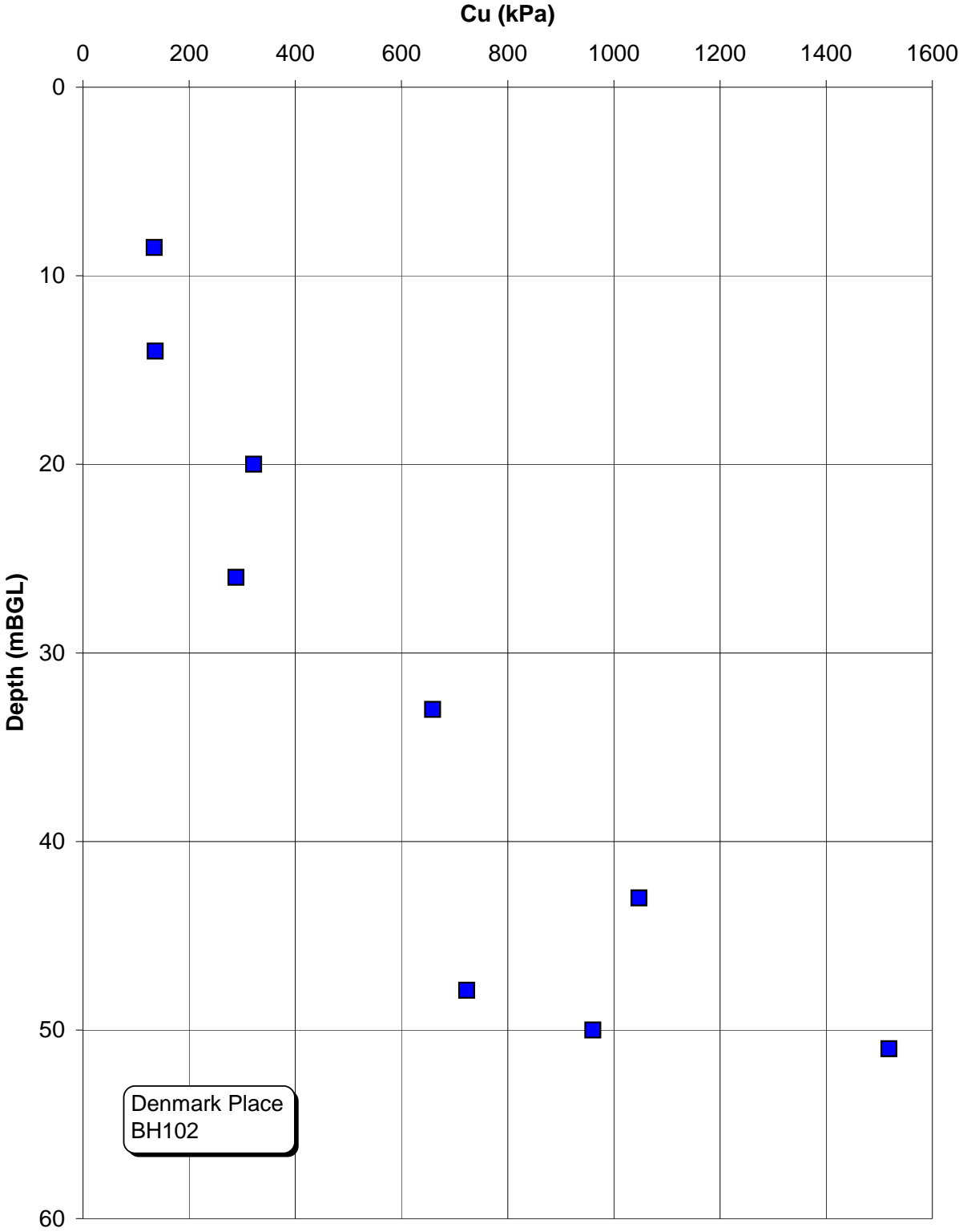
Insitu lateral stress vs Depth



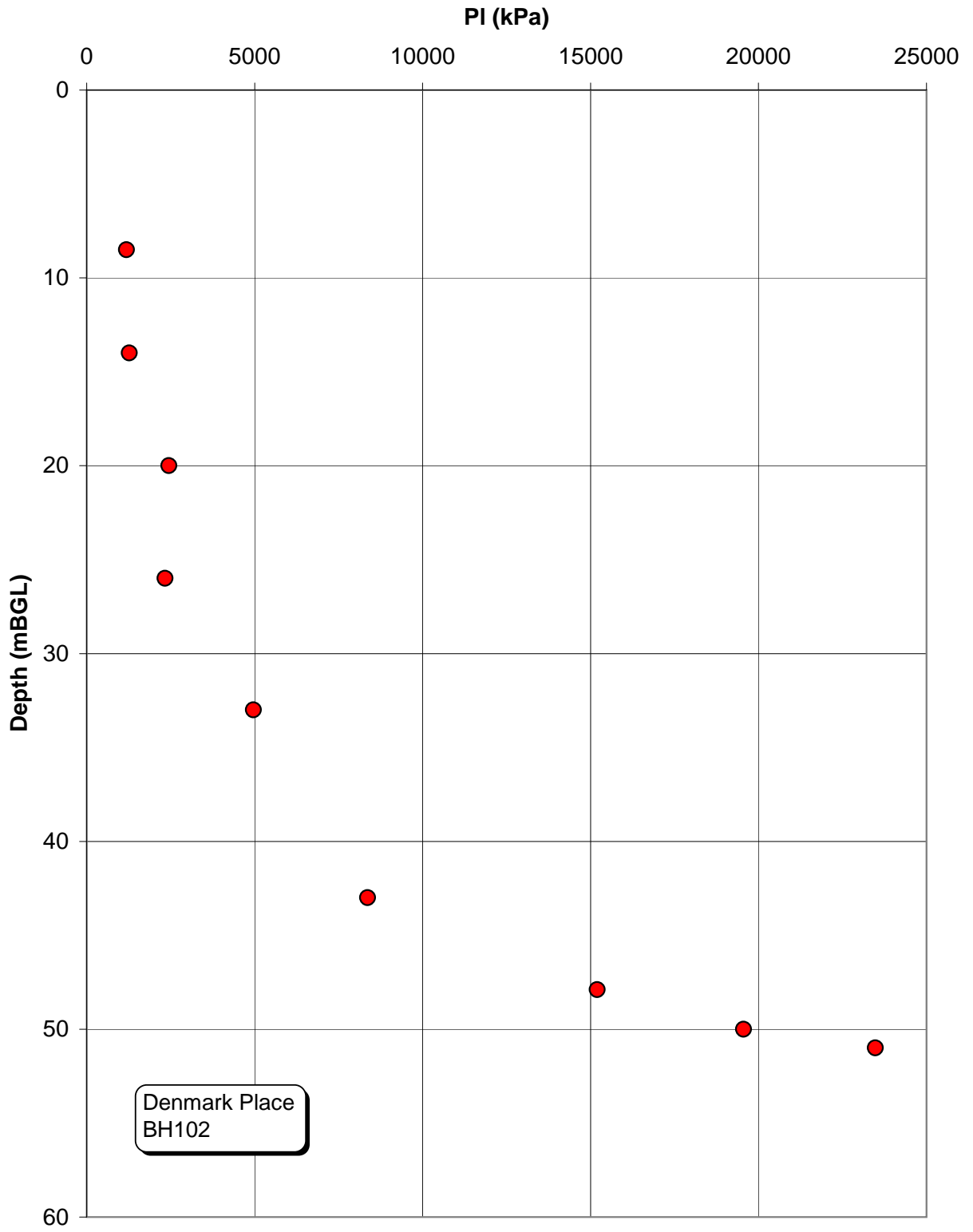
Coefficient of earth pressure at rest vs Depth



Undrained shear strength vs Depth



Limit pressure vs Depth



Yield stress vs Depth

